Conforms to US OSHA Hazard Communication 29CFR1910.1200

# SAFETY DATA SHEET

XL2-Blue MRF Ultracompetent Cells, Part Number 200151

## Section 1. Identification

### 1.1 Product identifier

**Product name** : XL2-Blue MRF Ultracompetent Cells, Part Number 200151

**Part no. (chemical kit)** : 200151

**Part no.** :

| | |
|---|---|
| XL2-Blue MRF' ultracompetent cells | 200151-41 |
| pUC 18 DNA Control Plasmid | 200231-42 |
| 2-Mercaptoethanol For Ultra Comp Cells | 210210-43 |

**Validation date** : 11/23/2018

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Material uses** : Analytical reagent.

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|---|---|
| XL2-Blue MRF' ultracompetent cells | 1000 µl (10 x 100 µl) |
| pUC 18 DNA Control Plasmid | 10 µl (0.1 ng/µl) |
| 2-Mercaptoethanol For Ultra Comp Cells | 25 µl (1.22 M  25 µl) |

### 1.3 Details of the supplier of the safety data sheet

**Supplier/Manufacturer** : Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

### 1.4 Emergency telephone number

**In case of emergency** : CHEMTREC®: 1-800-424-9300

## Section 2. Hazards identification

### 2.1 Classification of the substance or mixture

**OSHA/HCS status** :

| | |
|---|---|
| XL2-Blue MRF' ultracompetent cells<br>pUC 18 DNA Control Plasmid | This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910. 1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product. |
| 2-Mercaptoethanol For Ultra Comp Cells | This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). |

### Classification of the substance or mixture

**XL2-Blue MRF' ultracompetent cells**

| | |
|---|---|
| H320 | EYE IRRITATION - Category 2B |

**2-Mercaptoethanol For Ultra Comp Cells**

| | |
|---|---|
| H312 | ACUTE TOXICITY (dermal) - Category 4 |
| H318 | SERIOUS EYE DAMAGE - Category 1 |
| H317 | SKIN SENSITIZATION - Category 1 |
| H412 | AQUATIC HAZARD (LONG-TERM) - Category 3 |

# Section 2. Hazards identification

| | | | |
|---|---|---|---|
| **Ingredients of unknown toxicity** | : | XL2-Blue MRF' ultracompetent cells | Percentage of the mixture consisting of ingredient (s) of unknown dermal toxicity: 1 - 10%<br>Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 10 - 30% |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 1 - 10% |

## 2.2 GHS label elements

**Hazard pictograms** : 2-Mercaptoethanol For Ultra Comp Cells

| | | | |
|---|---|---|---|
| **Signal word** | : | XL2-Blue MRF' ultracompetent cells | Warning |
| | | pUC 18 DNA Control Plasmid | No signal word. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Danger |
| **Hazard statements** | : | XL2-Blue MRF' ultracompetent cells | H320 - Causes eye irritation. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | H312 - Harmful in contact with skin.<br><br>H318 - Causes serious eye damage.<br>H317 - May cause an allergic skin reaction.<br>H412 - Harmful to aquatic life with long lasting effects. |

### Precautionary statements

| | | | |
|---|---|---|---|
| **Prevention** | : | XL2-Blue MRF' ultracompetent cells | P264 - Wash hands thoroughly after handling. |
| | | pUC 18 DNA Control Plasmid | Not applicable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.<br>P273 - Avoid release to the environment.<br>P261 - Avoid breathing vapor.<br>P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace. |
| **Response** | : | XL2-Blue MRF' ultracompetent cells | P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>P337 + P313 - If eye irritation persists: Get medical attention. |
| | | pUC 18 DNA Control Plasmid | Not applicable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | P302 + P352 + P312 + P363 - IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Wash contaminated clothing before reuse.<br>P333 + P313 - If skin irritation or rash occurs: Get medical attention.<br>P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician. |

# Section 2. Hazards identification

| | | | |
|---|---|---|---|
| **Storage** | : | XL2-Blue MRF' ultracompetent cells | Not applicable. |
| | | pUC 18 DNA Control Plasmid | Not applicable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not applicable. |
| **Disposal** | : | XL2-Blue MRF' ultracompetent cells | Not applicable. |
| | | pUC 18 DNA Control Plasmid | Not applicable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| **Supplemental label elements** | : | XL2-Blue MRF' ultracompetent cells | None known. |
| | | pUC 18 DNA Control Plasmid | None known. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | None known. |

## 2.3 Other hazards

| | | | |
|---|---|---|---|
| **Hazards not otherwise classified** | : | XL2-Blue MRF' ultracompetent cells | None known. |
| | | pUC 18 DNA Control Plasmid | None known. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | None known. |

# Section 3. Composition/information on ingredients

| | | | |
|---|---|---|---|
| **Substance/mixture** | : | XL2-Blue MRF' ultracompetent cells | Mixture |
| | | pUC 18 DNA Control Plasmid | Mixture |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Mixture |

| Ingredient name | % | CAS number |
|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | |
| Glycerol | ≥10 - ≤25 | 56-81-5 |
| Dimethyl sulfoxide | ≤10 | 67-68-5 |
| Potassium chloride | ≤3 | 7447-40-7 |
| **2-Mercaptoethanol For Ultra Comp Cells** | | |
| 2-Mercaptoethanol | <10 | 60-24-2 |
| Sodium chloride | ≤8.8 | 7647-14-5 |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

**Occupational exposure limits, if available, are listed in Section 8.**

# Section 4. First aid measures

## 4.1 Description of necessary first aid measures

| | | | |
|---|---|---|---|
| **Eye contact** | : | XL2-Blue MRF' ultracompetent cells | Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention. |
| | | pUC 18 DNA Control Plasmid | Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get |

# Section 4. First aid measures

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| | | | medical attention if irritation occurs. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. |
| **Inhalation** | : | XL2-Blue MRF' ultracompetent cells | Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |
| | | pUC 18 DNA Control Plasmid | Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |
| **Skin contact** | : | XL2-Blue MRF' ultracompetent cells | Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse. |
| | | pUC 18 DNA Control Plasmid | Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. |

# Section 4. First aid measures

| | | | |
|---|---|---|---|
| **Ingestion** | : | XL2-Blue MRF' ultracompetent cells | Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |
| | | pUC 18 DNA Control Plasmid | Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |

## 4.2 Most important symptoms/effects, acute and delayed

### Potential acute health effects

| | | | |
|---|---|---|---|
| **Eye contact** | : | XL2-Blue MRF' ultracompetent cells | Causes eye irritation. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Causes serious eye damage. |
| **Inhalation** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |

# Section 4. First aid measures

| | | | |
|---|---|---|---|
| **Skin contact** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Harmful in contact with skin. May cause an allergic skin reaction. |
| **Ingestion** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |

**Over-exposure signs/symptoms**

| | | | |
|---|---|---|---|
| **Eye contact** | : | XL2-Blue MRF' ultracompetent cells | Adverse symptoms may include the following:<br>irritation<br>watering<br>redness |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Adverse symptoms may include the following:<br>pain<br>watering<br>redness |
| **Inhalation** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No specific data. |
| **Skin contact** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Adverse symptoms may include the following:<br>pain or irritation<br>redness<br>blistering may occur |
| **Ingestion** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Adverse symptoms may include the following:<br>stomach pains |

**4.3 Indication of immediate medical attention and special treatment needed, if necessary**

| | | | |
|---|---|---|---|
| **Notes to physician** | : | XL2-Blue MRF' ultracompetent cells | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. |
| | | pUC 18 DNA Control Plasmid | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. |

# Section 4. First aid measures

| | | | |
|---|---|---|---|
| **Specific treatments** | : | XL2-Blue MRF' ultracompetent cells | No specific treatment. |
| | | pUC 18 DNA Control Plasmid | No specific treatment. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No specific treatment. |
| **Protection of first-aiders** | : | XL2-Blue MRF' ultracompetent cells | No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. |
| | | pUC 18 DNA Control Plasmid | No action shall be taken involving any personal risk or without suitable training. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. |

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## 5.1 Extinguishing media

| | | | |
|---|---|---|---|
| **Suitable extinguishing media** | : | XL2-Blue MRF' ultracompetent cells | Use an extinguishing agent suitable for the surrounding fire. |
| | | pUC 18 DNA Control Plasmid | Use an extinguishing agent suitable for the surrounding fire. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Use an extinguishing agent suitable for the surrounding fire. |
| **Unsuitable extinguishing media** | : | XL2-Blue MRF' ultracompetent cells | None known. |
| | | pUC 18 DNA Control Plasmid | None known. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | None known. |

## 5.2 Special hazards arising from the substance or mixture

| | | | |
|---|---|---|---|
| **Specific hazards arising from the chemical** | : | XL2-Blue MRF' ultracompetent cells | In a fire or if heated, a pressure increase will occur and the container may burst. |
| | | pUC 18 DNA Control Plasmid | In a fire or if heated, a pressure increase will occur and the container may burst. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. |
| **Hazardous thermal decomposition products** | : | XL2-Blue MRF' ultracompetent cells | Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>sulfur oxides<br>halogenated compounds<br>metal oxide/oxides |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra | Decomposition products may include the following |

# Section 5. Fire-fighting measures

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|---|---|---|
| | Comp Cells | materials:<br>carbon dioxide<br>carbon monoxide<br>sulfur oxides<br>halogenated compounds<br>metal oxide/oxides |

## 5.3 Advice for firefighters

| | | | |
|---|---|---|---|
| **Special protective actions for fire-fighters** | : | ☒ XL2-Blue MRF' ultracompetent cells | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| | | pUC 18 DNA Control Plasmid | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| **Special protective equipment for fire-fighters** | : | ☒ XL2-Blue MRF' ultracompetent cells | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |
| | | pUC 18 DNA Control Plasmid | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |

# Section 6. Accidental release measures

## 6.1 Personal precautions, protective equipment and emergency procedures

| | | | |
|---|---|---|---|
| **For non-emergency personnel** | : | ☒ XL2-Blue MRF' ultracompetent cells | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
| | | pUC 18 DNA Control Plasmid | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when |

# Section 6. Accidental release measures

| | | |
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| | | ventilation is inadequate. Put on appropriate personal protective equipment. |
| **For emergency responders** | : XL2-Blue MRF' ultracompetent cells | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". |
| | pUC 18 DNA Control Plasmid | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". |
| | 2-Mercaptoethanol For Ultra Comp Cells | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". |
| **6.2 Environmental precautions** | : XL2-Blue MRF' ultracompetent cells | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). |
| | pUC 18 DNA Control Plasmid | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). |
| | 2-Mercaptoethanol For Ultra Comp Cells | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. |

### 6.3 Methods and materials for containment and cleaning up

| | | |
|---|---|---|
| **Methods for cleaning up** | : XL2-Blue MRF' ultracompetent cells | Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. |
| | pUC 18 DNA Control Plasmid | Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. |
| | 2-Mercaptoethanol For Ultra Comp Cells | Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. |

# Section 7. Handling and storage

## 7.1 Precautions for safe handling

| | | | |
|---|---|---|---|
| **Protective measures** | : | XL2-Blue MRF' ultracompetent cells | Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. |
| | | pUC 18 DNA Control Plasmid | Put on appropriate personal protective equipment (see Section 8). |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. |
| **Advice on general occupational hygiene** | : | XL2-Blue MRF' ultracompetent cells | Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. |
| | | pUC 18 DNA Control Plasmid | Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. |
| **7.2 Conditions for safe storage, including any incompatibilities** | : | XL2-Blue MRF' ultracompetent cells | Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid |

# Section 7. Handling and storage

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|---|---|---|
| | | environmental contamination. See Section 10 for incompatible materials before handling or use. |
| | pUC 18 DNA Control Plasmid | Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |
| | 2-Mercaptoethanol For Ultra Comp Cells | Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |

## 7.3 Specific end use(s)

| | | | |
|---|---|---|---|
| **Recommendations** | : | ☒ XL2-Blue MRF' ultracompetent cells | Industrial applications, Professional applications. |
| | | pUC 18 DNA Control Plasmid | Industrial applications, Professional applications. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Industrial applications, Professional applications. |
| **Industrial sector specific solutions** | : | ☒ XL2-Blue MRF' ultracompetent cells | Not applicable. |
| | | pUC 18 DNA Control Plasmid | Not applicable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not applicable. |

# Section 8. Exposure controls/personal protection

## 8.1 Control parameters

### Occupational exposure limits

| Ingredient name | Exposure limits |
|---|---|
| **☒ XL2-Blue MRF' ultracompetent cells** | |
| Glycerol | **OSHA PEL 1989 (United States, 3/1989).**<br>TWA: 5 mg/m³ 8 hours. Form: Respirable fraction<br>TWA: 10 mg/m³ 8 hours. Form: Total dust<br>**OSHA PEL (United States, 6/2016).**<br>TWA: 5 mg/m³ 8 hours. Form: Respirable fraction<br>TWA: 15 mg/m³ 8 hours. Form: Total dust |
| Dimethyl sulfoxide | **AIHA WEEL (United States, 10/2011).**<br>TWA: 250 ppm 8 hours. |
| Potassium chloride | None. |
| **2-Mercaptoethanol For Ultra Comp Cells** | |

# Section 8. Exposure controls/personal protection

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|---|---|
| 2-Mercaptoethanol | **AIHA WEEL (United States, 10/2011). Absorbed through skin.** TWA: 0.2 ppm 8 hours. |
| Sodium chloride | None. |

## 8.2 Exposure controls

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## Individual protection measures

**Hygiene measures** : Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

## Skin protection

**Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

# Section 9. Physical and chemical properties

## 9.1 Information on basic physical and chemical properties

### Appearance

**Physical state** :

| | |
|---|---|
| XL2-Blue MRF' ultracompetent cells | Liquid. |
| pUC 18 DNA Control Plasmid | Liquid. |
| 2-Mercaptoethanol For Ultra Comp Cells | Liquid. |

# Section 9. Physical and chemical properties

| | | | |
|---|---|---|---|
| **Color** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Odor** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Odor threshold** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **pH** | : | XL2-Blue MRF' ultracompetent cells | 6.4 |
| | | pUC 18 DNA Control Plasmid | 7.5 |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Melting point** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | 0°C (32°F) |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Boiling point** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | 100°C (212°F) |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Flash point** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Evaporation rate** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Flammability (solid, gas)** | : | XL2-Blue MRF' ultracompetent cells | Not applicable. |
| | | pUC 18 DNA Control Plasmid | Not applicable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not applicable. |
| **Lower and upper explosive (flammable) limits** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Vapor pressure** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Vapor density** | : | | |

## Section 9. Physical and chemical properties

| | | | |
|---|---|---|---|
| | | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Relative density** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Solubility** | : | XL2-Blue MRF' ultracompetent cells | Soluble in the following materials: cold water and hot water. |
| | | pUC 18 DNA Control Plasmid | Easily soluble in the following materials: cold water and hot water. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Soluble in the following materials: cold water and hot water. |
| **Partition coefficient: n-octanol/water** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Auto-ignition temperature** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Decomposition temperature** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |
| **Viscosity** | : | XL2-Blue MRF' ultracompetent cells | Not available. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Not available. |

## Section 10. Stability and reactivity

| | | | |
|---|---|---|---|
| **10.1 Reactivity** | : | XL2-Blue MRF' ultracompetent cells | No specific test data related to reactivity available for this product or its ingredients. |
| | | pUC 18 DNA Control Plasmid | No specific test data related to reactivity available for this product or its ingredients. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No specific test data related to reactivity available for this product or its ingredients. |
| **10.2 Chemical stability** | : | XL2-Blue MRF' ultracompetent cells | The product is stable. |
| | | pUC 18 DNA Control Plasmid | The product is stable. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | The product is stable. |

# Section 10. Stability and reactivity

| | | | |
|---|---|---|---|
| **10.3 Possibility of hazardous reactions** | : | XL2-Blue MRF' ultracompetent cells | Under normal conditions of storage and use, hazardous reactions will not occur. |
| | | pUC 18 DNA Control Plasmid | Under normal conditions of storage and use, hazardous reactions will not occur. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Under normal conditions of storage and use, hazardous reactions will not occur. |
| **10.4 Conditions to avoid** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No specific data. |
| **10.5 Incompatible materials** | : | XL2-Blue MRF' ultracompetent cells | May react or be incompatible with oxidizing materials. |
| | | pUC 18 DNA Control Plasmid | May react or be incompatible with oxidizing materials. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | May react or be incompatible with oxidizing materials. |
| **10.6 Hazardous decomposition products** | : | XL2-Blue MRF' ultracompetent cells | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| | | pUC 18 DNA Control Plasmid | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

# Section 11. Toxicological information

## 11.1 Information on toxicological effects

### Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | | | |
| Glycerol | LD50 Oral | Rat | 12600 mg/kg | - |
| Dimethyl sulfoxide | LD50 Dermal | Rat | 40000 mg/kg | - |
| | LD50 Oral | Rat | 14500 mg/kg | - |
| Potassium chloride | LD50 Oral | Rat | 2600 mg/kg | - |
| **2-Mercaptoethanol For Ultra Comp Cells** | | | | |
| 2-Mercaptoethanol | LD50 Dermal | Rabbit | 167.1 mg/kg | - |
| | LD50 Oral | Rat | 244 mg/kg | - |
| Sodium chloride | LD50 Oral | Rat | 3000 mg/kg | - |

### Irritation/Corrosion

# Section 11. Toxicological information

| Product/ingredient name | Result | Species | Score | Exposure | Observation |
|---|---|---|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | | | | |
| Glycerol | Eyes - Mild irritant | Rabbit | - | 24 hours 500 milligrams | - |
| | Skin - Mild irritant | Rabbit | - | 24 hours 500 milligrams | - |
| Dimethyl sulfoxide | Eyes - Mild irritant | Rabbit | - | 24 hours 500 milligrams | - |
| | Eyes - Mild irritant | Rabbit | - | 100 milligrams | - |
| | Skin - Mild irritant | Rabbit | - | 24 hours 500 milligrams | - |
| | Skin - Mild irritant | Rabbit | - | 100 milligrams | - |
| Potassium chloride | Eyes - Mild irritant | Rabbit | - | 24 hours 500 milligrams | - |
| **2-Mercaptoethanol For Ultra Comp Cells** | | | | | |
| 2-Mercaptoethanol | Eyes - Severe irritant | Rabbit | - | 2 milligrams | - |
| Sodium chloride | Eyes - Moderate irritant | Rabbit | - | 24 hours 100 milligrams | - |
| | Eyes - Moderate irritant | Rabbit | - | 10 milligrams | - |
| | Skin - Mild irritant | Rabbit | - | 24 hours 500 milligrams | - |

**Sensitization**

Not available.

**Conclusion/Summary**

**Skin** : May cause skin sensitization.

**Mutagenicity**

**Conclusion/Summary** : Not available.

**Carcinogenicity**

**Conclusion/Summary** : Not available.

**Reproductive toxicity**

**Conclusion/Summary** : Not available.

**Teratogenicity**

**Conclusion/Summary** : Not available.

**Specific target organ toxicity (single exposure)**

| Name | Category | Route of exposure | Target organs |
|---|---|---|---|
| **2-Mercaptoethanol For Ultra Comp Cells** | | | |
| 2-Mercaptoethanol | Category 3 | Not applicable. | Respiratory tract irritation |

**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

# Section 11. Toxicological information

| | | | |
|---|---|---|---|
| **Information on the likely routes of exposure** | : | XL2-Blue MRF' ultracompetent cells | Routes of entry anticipated: Oral, Dermal, Inhalation. |
| | | pUC 18 DNA Control Plasmid | Not available. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Routes of entry anticipated: Oral, Dermal, Inhalation. |

**Potential acute health effects**

| | | | |
|---|---|---|---|
| **Eye contact** | : | XL2-Blue MRF' ultracompetent cells | Causes eye irritation. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Causes serious eye damage. |
| **Inhalation** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |
| **Skin contact** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Harmful in contact with skin. May cause an allergic skin reaction. |
| **Ingestion** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |

**Symptoms related to the physical, chemical and toxicological characteristics**

| | | | |
|---|---|---|---|
| **Eye contact** | : | XL2-Blue MRF' ultracompetent cells | Adverse symptoms may include the following:<br>irritation<br>watering<br>redness |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Adverse symptoms may include the following:<br>pain<br>watering<br>redness |
| **Inhalation** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No specific data. |
| **Skin contact** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Adverse symptoms may include the following:<br>pain or irritation<br>redness<br>blistering may occur |

# Section 11. Toxicological information

| | | | |
|---|---|---|---|
| **Ingestion** | : | XL2-Blue MRF' ultracompetent cells | No specific data. |
| | | pUC 18 DNA Control Plasmid | No specific data. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Adverse symptoms may include the following:<br><br>stomach pains |

## Delayed and immediate effects and also chronic effects from short and long term exposure

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

| | | | |
|---|---|---|---|
| **General** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. |
| **Carcinogenicity** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |
| **Mutagenicity** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |
| **Teratogenicity** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |
| **Developmental effects** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |
| **Fertility effects** | : | XL2-Blue MRF' ultracompetent cells | No known significant effects or critical hazards. |
| | | pUC 18 DNA Control Plasmid | No known significant effects or critical hazards. |
| | | 2-Mercaptoethanol For Ultra Comp Cells | No known significant effects or critical hazards. |

## Numerical measures of toxicity

### Acute toxicity estimates

# Section 11. Toxicological information

| Route | ATE value |
|---|---|
| **XL2-Blue MRF' ultracompetent cells** | |
| Oral | 136842.1 mg/kg |
| **2-Mercaptoethanol For Ultra Comp Cells** | |
| Oral | 2417.3 mg/kg |
| Dermal | 1758.9 mg/kg |
| Inhalation (vapors) | 21.05 mg/l |

# Section 12. Ecological information

## 12.1 Toxicity

| Product/ingredient name | Result | Species | Exposure |
|---|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | | |
| Glycerol | Acute LC50 54000 mg/l Fresh water | Fish - Oncorhynchus mykiss | 96 hours |
| Dimethyl sulfoxide | Acute EC50 18299 µg/l Marine water | Algae - Nitzschia pungens | 96 hours |
| | Acute LC50 37.437 mg/l Marine water | Crustaceans - Artemia sp. | 48 hours |
| | Acute LC50 25000 ppm Fresh water | Daphnia - Daphnia magna - Neonate | 48 hours |
| | Acute LC50 34000000 µg/l Fresh water | Fish - Pimephales promelas | 96 hours |
| | Chronic NOEC 3323 µg/l Marine water | Algae - Nitzschia pungens | 96 hours |
| Potassium chloride | Acute EC50 1337000 µg/l Fresh water | Algae - Navicula seminulum | 96 hours |
| | Acute EC50 9.24 g/L Fresh water | Algae - Desmodesmus subspicatus | 72 hours |
| | Acute EC50 141460 µg/l Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute LC50 12.92 mg/l Fresh water | Crustaceans - Pseudosida ramosa - Neonate | 48 hours |
| | Acute LC50 880 mg/l Fresh water | Fish - Pimephales promelas | 96 hours |
| **2-Mercaptoethanol For Ultra Comp Cells** | | | |
| Sodium chloride | Acute EC50 4.74 g/L Fresh water | Algae - Chlamydomonas reinhardtii | 96 hours |
| | Acute EC50 519.6 mg/l Fresh water | Crustaceans - Cypris subglobosa | 48 hours |
| | Acute EC50 402600 µg/l Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute IC50 6.87 g/L Fresh water | Aquatic plants - Lemna minor | 96 hours |
| | Acute LC50 1000000 µg/l Fresh water | Fish - Morone saxatilis - Larvae | 96 hours |
| | Chronic LC10 781 mg/l Fresh water | Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling) | 3 weeks |
| | Chronic NOEC 6 g/L Fresh water | Aquatic plants - Lemna minor | 96 hours |
| | Chronic NOEC 0.314 g/L Fresh water | Daphnia - Daphnia pulex | 21 days |
| | Chronic NOEC 100 mg/l Fresh water | Fish - Gambusia holbrooki - Adult | 8 weeks |

## 12.2 Persistence and degradability

# Section 12. Ecological information

| Product/ingredient name | Test | Result | Dose | Inoculum |
|---|---|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | | | |
| Glycerol | 301D Ready Biodegradability - Closed Bottle Test | 93 % - 30 days | - | - |
| **2-Mercaptoethanol For Ultra Comp Cells** | | | | |
| 2-Mercaptoethanol | OECD 310 Ready Biodegradability - $CO_2$ in Sealed Vessels (Headspace Test) | 69 % - Inherent - 60 days | 20 mg/l | - |

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|---|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | | |
| Potassium chloride | - | - | Readily |

## 12.3 Bioaccumulative potential

| Product/ingredient name | $LogP_{ow}$ | BCF | Potential |
|---|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | | |
| Glycerol | -1.76 | - | low |
| Dimethyl sulfoxide | -1.35 | 3.16 | low |
| Potassium chloride | -0.46 | - | low |
| **2-Mercaptoethanol For Ultra Comp Cells** | | | |
| 2-Mercaptoethanol | -0.056 | - | low |

## 12.4 Mobility in soil

**Soil/water partition coefficient ($K_{OC}$)** : Not available.

**12.5 Other adverse effects** : No known significant effects or critical hazards.

# Section 13. Disposal considerations

## 13.1 Waste treatment methods

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains

## Section 13. Disposal considerations

and sewers.

**Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.**

**The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.**

**Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.**

## Section 14. Transport information

**DOT / TDG / Mexico / IMDG / IATA** : Not regulated.

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL and the IBC Code** : Not available.

## Section 15. Regulatory information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

**Clean Water Act (CWA) 311**: Edetic acid

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

**SARA 302/304**

**Composition/information on ingredients**

No products were found.

**SARA 304 RQ** : Not applicable.

**SARA 311/312**

# Section 15. Regulatory information

**Classification** : XL2-Blue MRF' ultracompetent cells
EYE IRRITATION - Category 2B

pUC 18 DNA Control Plasmid
Not applicable.

2-Mercaptoethanol For Ultra Comp Cells
ACUTE TOXICITY (dermal) - Category 4

SERIOUS EYE DAMAGE - Category 1
SKIN SENSITIZATION - Category 1

## Composition/information on ingredients

| Name | % | Classification |
|---|---|---|
| **XL2-Blue MRF' ultracompetent cells** | | |
| Glycerol | ≥10 - ≤25 | EYE IRRITATION - Category 2A |
| Dimethyl sulfoxide | ≤10 | FLAMMABLE LIQUIDS - Category 4<br>EYE IRRITATION - Category 2A |
| Sucrose | ≤10 | COMBUSTIBLE DUSTS |
| Potassium chloride | ≤3 | EYE IRRITATION - Category 2A |
| **2-Mercaptoethanol For Ultra Comp Cells** | | |
| 2-Mercaptoethanol | <10 | FLAMMABLE LIQUIDS - Category 4<br>ACUTE TOXICITY (oral) - Category 3<br>ACUTE TOXICITY (dermal) - Category 2<br>ACUTE TOXICITY (inhalation) - Category 2<br>SKIN IRRITATION - Category 2<br>SERIOUS EYE DAMAGE - Category 1<br>SKIN SENSITIZATION - Category 1<br>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |
| Sodium chloride | ≤8.8 | EYE IRRITATION - Category 2A |

## State regulations

**Massachusetts** : The following components are listed: SUCROSE DUST; GLYCERINE MIST; 2-MERCAPTOETHANOL

**New York** : None of the components are listed.

**New Jersey** : The following components are listed: DIMETHYL SULFOXIDE; METHANE, SULFINYLBIS-; GLYCERIN; 1,2,3-PROPANETRIOL; THIOGLYCOL; 2-MERCAPTOETHANOL

**Pennsylvania** : The following components are listed: .ALPHA.-D-GLUCOPYRANOSIDE, .BETA.-D-FRUCTOFURANOSYL; 1,2,3-PROPANETRIOL; ETHANOL, 2-MERCAPTO-

## International regulations

### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

### Montreal Protocol (Annexes A, B, C, E)

Not listed.

### Stockholm Convention on Persistent Organic Pollutants

Not listed.

### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

## Inventory list

**Australia** : All components are listed or exempted.

# Section 15. Regulatory information

| | | |
|---|---|---|
| **Canada** | : | All components are listed or exempted. |
| **China** | : | Not determined. |
| **Europe** | : | All components are listed or exempted. |
| **Japan** | : | **Japan inventory (ENCS)**: Not determined.<br>**Japan inventory (ISHL)**: All components are listed or exempted. |
| **Malaysia** | : | Not determined. |
| **New Zealand** | : | Not determined. |
| **Philippines** | : | Not determined. |
| **Republic of Korea** | : | All components are listed or exempted. |
| **Taiwan** | : | All components are listed or exempted. |
| **Thailand** | : | Not determined. |
| **Turkey** | : | Not determined. |
| **United States** | : | All components are listed or exempted. |
| **Viet Nam** | : | Not determined. |

# Section 16. Other information

## History

| | | |
|---|---|---|
| **Date of issue** | : | 11/23/2018 |
| **Date of previous issue** | : | 10/17/2016 |
| **Version** | : | 5 |

## Procedure used to derive the classification

| Classification | Justification |
|---|---|
| **XL2-Blue MRF' ultracompetent cells** | |
| EYE IRRITATION - Category 2B | Calculation method |
| **2-Mercaptoethanol For Ultra Comp Cells** | |
| ACUTE TOXICITY (dermal) - Category 4 | Calculation method |
| SERIOUS EYE DAMAGE - Category 1 | Calculation method |
| SKIN SENSITIZATION - Category 1 | Calculation method |
| AQUATIC HAZARD (LONG-TERM) - Category 3 | Calculation method |

**Indicates information that has changed from previously issued version.**

## Notice to reader

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